SEQUENCE LISTING

<110> Forschungszentrum Juelich GmbH

<120> NUCLEOTIDE SEQUENCES THAT ENCODE CORYNEFORM BACTERIA FOR PROTEINS PARTICIPATING IN THE BIOSYNTHESIS OF L-SERINE AND METHOD OF PRODUCING L-SERINE

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<170> PatentIn Ver. 2.1

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Asp Gly Pro Asn Arg Pro Glu Leu Leu Asp Ala Val Lys Glu Ala Asp
        35                  40                  45

Ala Leu Leu Val Arg Ser Ala Thr Thr Val Asp Ala Glu Val Ile Ala
    50                  55                  60

Ala Ala Pro Asn Leu Lys Ile Val Gly Arg Ala Gly Val Gly Leu Asp
65                  70                  75                  80

Asn Val Asp Ile Pro Ala Ala Thr Glu Ala Gly Val Met Val Ala Asn
                85                  90                  95

Ala Pro Thr Ser Asn Ile His Ser Ala Cys Glu His Ala Ile Ser Leu
            100                 105                 110

Leu Leu Ser Thr Ala Arg Gln Ile Pro Ala Ala Asp Ala Thr Leu Arg
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Glu Gly Glu Trp Lys Arg Ser Ser Phe Asn Gly Val Glu Ile Phe Gly
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Lys Thr Val Gly Ile Val Gly Phe Gly His Ile Gly Gln Leu Phe Ala
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Gln Arg Leu Ala Ala Phe Glu Thr Thr Ile Val Ala Tyr Asp Pro Tyr
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Ala Asn Pro Ala Arg Ala Ala Gln Leu Asn Val Glu Leu Val Glu Leu
            180                 185                 190

Asp Glu Leu Met Ser Arg Ser Asp Phe Val Thr Ile His Leu Pro Lys
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Thr Lys Glu Thr Ala Gly Met Phe Asp Ala Gln Leu Leu Ala Lys Ser
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Lys Lys Gly Gln Ile Ile Ile Asn Ala Ala Arg Gly Gly Leu Val Asp
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Glu Gln Ala Leu Ala Asp Ala Ile Glu Ser Gly His Ile Arg Gly Ala
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Gly Phe Asp Val Tyr Ser Thr Glu Pro Cys Thr Asp Ser Pro Leu Phe
            260                 265                 270

Lys Leu Pro Gln Val Val Val Thr Pro His Leu Gly Ala Ser Thr Glu
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Glu Ala Gln Asp Arg Ala Gly Thr Asp Val Ala Asp Ser Val Leu Lys
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Ala Leu Ala Gly Glu Phe Val Ala Asp Ala Val Asn Val Ser Gly Gly
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Arg Val Gly Glu Glu Val Ala Val Trp Met Asp Leu Ala
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Asp Gly Pro Asn Arg Pro Glu Leu Leu Asp Ala Val Lys Glu Ala Asp
         35                  40                  45

Ala Leu Leu Val Arg Ser Ala Thr Thr Val Asp Ala Glu Val Ile Ala
     50                  55                  60

Ala Ala Pro Asn Leu Lys Ile Val Gly Arg Ala Gly Val Gly Leu Asp
 65                  70                  75                  80

Asn Val Asp Ile Pro Ala Ala Thr Glu Ala Gly Val Met Val Ala Asn
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Ala Pro Thr Ser Asn Ile His Ser Ala Cys Glu His Ala Ile Ser Leu
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Glu Gly Glu Trp Lys Arg Ser Ser Phe Asn Gly Val Glu Ile Phe Gly
    130                 135                 140

Lys Thr Val Gly Ile Val Gly Phe Gly His Ile Gly Gln Leu Phe Ala
145                 150                 155                 160

Gln Arg Leu Ala Ala Phe Glu Thr Thr Ile Val Ala Tyr Asp Pro Tyr
                165                 170                 175

Ala Asn Pro Ala Arg Ala Ala Gln Leu Asn Val Glu Leu Val Glu Leu
            180                 185                 190

Asp Glu Leu Met Ser Arg Ser Asp Phe Val Thr Ile His Leu Pro Lys
        195                 200                 205

Thr Lys Glu Thr Ala Gly Met Phe Asp Ala Gln Leu Leu Ala Lys Ser
    210                 215                 220

Lys Lys Gly Gln Ile Ile Ile Asn Ala Ala Arg Gly Gly Leu Val Asp
225                 230                 235                 240

Glu Gln Ala Leu Ala Asp Ala Ile Glu Ser Gly His Ile Arg Gly Ala
                245                 250                 255

Gly Phe Asp Val Tyr Ser Thr Glu Pro Cys Thr Asp Ser Pro Leu Phe
            260                 265                 270

Lys Leu Pro Gln Val Val Val Thr Pro His Leu Gly Ala Ser Thr Glu
        275                 280                 285

Glu Ala Gln Asp Arg Ala Gly Thr Asp Val Ala Asp Ser Val Leu Lys
    290                 295                 300

Ala Leu Ala Gly Glu Phe Val Ala Asp Ala Val Asn Val Ser Gly Gly
305                 310                 315                 320

Arg Val Gly Glu Glu Val Ala Val Trp Met Asp Leu Ala Arg Lys Leu
                325                 330                 335

Gly Leu Leu Ala Gly Lys Leu Val Asp Ala Ala Pro Val Ser Ile Glu
            340                 345                 350

Val Glu Ala Arg Gly Glu Leu Ser Ser Glu Gln Val Asp Ala Leu Gly
        355                 360                 365

Leu Ser Ala Val Arg Gly Leu Phe Ser Gly Ile Ile Glu Glu Ser Val
    370                 375                 380

Thr Phe Val Asn Ala Pro Arg Ile Ala Glu Glu Arg Gly Leu Asp Ile
385                 390                 395                 400

Ser Val Lys Thr Asn Ser Glu Ser Val Thr His Arg Ser Val Leu Gln
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Val Lys Val Ile Thr Gly Ser Gly Ala Ser Ala Thr Val Val Gly Ala
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<213> Corynebacterium glutamicum

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            20                  25                  30

Asp Gly Pro Asn Arg Pro Glu Leu Leu Asp Ala Val Lys Glu Ala Asp
        35                  40                  45

Ala Leu Leu Val Arg Ser Ala Thr Thr Val Asp Ala Glu Val Ile Ala
    50                  55                  60

Ala Ala Pro Asn Leu Lys Ile Val Gly Arg Ala Gly Val Gly Leu Asp
65                  70                  75                  80

Asn Val Asp Ile Pro Ala Ala Thr Glu Ala Gly Val Met Val Ala Asn
                85                  90                  95

Ala Pro Thr Ser Asn Ile His Ser Ala Cys Glu His Ala Ile Ser Leu
            100                 105                 110

Leu Leu Ser Thr Ala Arg Gln Ile Pro Ala Ala Asp Ala Thr Leu Arg
        115                 120                 125

Glu Gly Glu Trp Lys Arg Ser Ser Phe Asn Gly Val Glu Ile Phe Gly
    130                 135                 140

Lys Thr Val Gly Ile Val Gly Phe Gly His Ile Gly Gln Leu Phe Ala
145                 150                 155                 160

Gln Arg Leu Ala Ala Phe Glu Thr Thr Ile Val Ala Tyr Asp Pro Tyr
                165                 170                 175

Ala Asn Pro Ala Arg Ala Ala Gln Leu Asn Val Glu Leu Val Glu Leu
            180                 185                 190

Asp Glu Leu Met Ser Arg Ser Asp Phe Val Thr Ile His Leu Pro Lys
        195                 200                 205

Thr Lys Glu Thr Ala Gly Met Phe Asp Ala Gln Leu Leu Ala Lys Ser
    210                 215                 220

Lys Lys Gly Gln Ile Ile Ile Asn Ala Ala Arg Gly Gly Leu Val Asp
225                 230                 235                 240
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Glu Gln Ala Leu Ala Asp Ala Ile Glu Ser Gly His Ile Arg Gly Ala
                245                 250                 255

Gly Phe Asp Val Tyr Ser Thr Glu Pro Cys Thr Asp Ser Pro Leu Phe
            260                 265                 270

Lys Leu Pro Gln Val Val Val Thr Pro His Leu Gly Ala Ser Thr Glu
        275                 280                 285

Glu Ala Gln Asp Arg Ala Gly Thr Asp Val Ala Asp Ser Val Leu Lys
    290                 295                 300

Ala Leu Ala Gly Glu Phe Val Ala Asp Ala Val Asn Val Ser Gly Gly
305                 310                 315                 320

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Gly Leu Leu Ala Gly Lys
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Gln Ser Thr Val Asp Ala Leu Gly Asp Ala Val Glu Val Arg Trp Val
            20                  25                  30

Asp Gly Pro Asn Arg Pro Glu Leu Leu Asp Ala Val Lys Glu Ala Asp
        35                  40                  45

Ala Leu Leu Val Arg Ser Ala Thr Thr Val Asp Ala Glu Val Ile Ala
    50                  55                  60

Ala Ala Pro Asn Leu Lys Ile Val Gly Arg Ala Gly Val Gly Leu Asp
65                  70                  75                  80

Asn Val Asp Ile Pro Ala Ala Thr Glu Ala Gly Val Met Val Ala Asn
                85                  90                  95

Ala Pro Thr Ser Asn Ile His Ser Ala Cys Glu His Ala Ile Ser Leu
            100                 105                 110

Leu Leu Ser Thr Ala Arg Gln Ile Pro Ala Ala Asp Ala Thr Leu Arg
        115                 120                 125

Glu Gly Glu Trp Lys Arg Ser Ser Phe Asn Gly Val Glu Ile Phe Gly
    130                 135                 140

Lys Thr Val Gly Ile Val Gly Phe Gly His Ile Gly Gln Leu Phe Ala
145                 150                 155                 160

Gln Arg Leu Ala Ala Phe Glu Thr Thr Ile Val Ala Tyr Asp Pro Tyr
                165                 170                 175
```

```
Ala Asn Pro Ala Arg Ala Ala Gln Leu Asn Val Glu Leu Val Glu Leu
            180                 185                 190

Asp Glu Leu Met Ser Arg Ser Asp Phe Val Thr Ile His Leu Pro Lys
        195                 200                 205

Thr Lys Glu Thr Ala Gly Met Phe Asp Ala Gln Leu Leu Ala Lys Ser
    210                 215                 220

Lys Lys Gly Gln Ile Ile Ile Asn Ala Ala Arg Gly Gly Leu Val Asp
225                 230                 235                 240

Glu Gln Ala Leu Ala Asp Ala Ile Glu Ser Gly His Ile Arg Gly Ala
                245                 250                 255

Gly Phe Asp Val Tyr Ser Thr Glu Pro Cys Thr Asp Ser Pro Leu Phe
            260                 265                 270

Lys Leu Pro Gln Val Val Val Thr Pro His Leu Gly Ala Ser Thr Glu
        275                 280                 285

Glu Ala Gln Asp Arg Ala Gly Thr Asp Val Ala Asp Ser Val Leu Lys
    290                 295                 300

Ala Leu Ala Gly Glu Phe Val Ala Asp Ala Val Asn Val Ser Gly Gly
305                 310                 315                 320

Arg Val Gly Glu Glu
                325
```

<210> 11
<211> 319
<212> PRT
<213> Corynebacterium glutamicum

<400> 11

```
Met Ser Gln Asn Gly Arg Pro Val Val Leu Ile Ala Asp Lys Leu Ala
  1                 5                  10                  15

Gln Ser Thr Val Asp Ala Leu Gly Asp Ala Val Glu Val Arg Trp Val
             20                  25                  30

Asp Gly Pro Asn Arg Pro Glu Leu Leu Asp Ala Val Lys Glu Ala Asp
         35                  40                  45

Ala Leu Leu Val Arg Ser Ala Thr Thr Val Asp Ala Glu Val Ile Ala
     50                  55                  60

Ala Ala Pro Asn Leu Lys Ile Val Gly Arg Ala Gly Val Gly Leu Asp
 65                  70                  75                  80

Asn Val Asp Ile Pro Ala Ala Thr Glu Ala Gly Val Met Val Ala Asn
                 85                  90                  95

Ala Pro Thr Ser Asn Ile His Ser Ala Cys Glu His Ala Ile Ser Leu
            100                 105                 110

Leu Leu Ser Thr Ala Arg Gln Ile Pro Ala Ala Asp Ala Thr Leu Arg
        115                 120                 125
```

```
Glu Gly Glu Trp Lys Arg Ser Ser Phe Asn Gly Val Glu Ile Phe Gly
    130                 135                 140

Lys Thr Val Gly Ile Val Gly Phe Gly His Ile Gly Gln Leu Phe Ala
145                 150                 155                 160

Gln Arg Leu Ala Ala Phe Glu Thr Thr Ile Val Ala Tyr Asp Pro Tyr
                165                 170                 175

Ala Asn Pro Ala Arg Ala Ala Gln Leu Asn Val Glu Leu Val Glu Leu
            180                 185                 190

Asp Glu Leu Met Ser Arg Ser Asp Phe Val Thr Ile His Leu Pro Lys
        195                 200                 205

Thr Lys Glu Thr Ala Gly Met Phe Asp Ala Gln Leu Leu Ala Lys Ser
    210                 215                 220

Lys Lys Gly Gln Ile Ile Ile Asn Ala Ala Arg Gly Gly Leu Val Asp
225                 230                 235                 240

Glu Gln Ala Leu Ala Asp Ala Ile Glu Ser Gly His Ile Arg Gly Ala
                245                 250                 255

Gly Phe Asp Val Tyr Ser Thr Glu Pro Cys Thr Asp Ser Pro Leu Phe
            260                 265                 270

Lys Leu Pro Gln Val Val Val Thr Pro His Leu Gly Ala Ser Thr Glu
        275                 280                 285

Glu Ala Gln Asp Arg Ala Gly Thr Asp Val Ala Asp Ser Val Leu Lys
    290                 295                 300

Ala Leu Ala Gly Glu Phe Val Ala Asp Ala Val Asn Val Ser Gly
305                 310                 315
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<210> 12
<211> 530
<212> PRT
<213> Corynebacterium glutamicum

<400> 12

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Met Ser Gln Asn Gly Arg Pro Val Val Leu Ile Ala Asp Lys Leu Ala
  1                 5                  10                  15

Gln Ser Thr Val Asp Ala Leu Gly Asp Ala Val Glu Val Arg Trp Val
             20                  25                  30

Asp Gly Pro Asn Arg Pro Glu Leu Leu Asp Ala Val Lys Glu Ala Asp
         35                  40                  45

Ala Leu Leu Val Arg Ser Ala Thr Thr Val Asp Ala Glu Val Ile Ala
     50                  55                  60

Ala Ala Pro Asn Leu Lys Ile Val Gly Arg Ala Gly Val Gly Leu Asp
 65                  70                  75                  80

Asn Val Asp Ile Pro Ala Ala Thr Glu Ala Gly Val Met Val Ala Asn
                 85                  90                  95
```

```
Ala Pro Thr Ser Asn Ile His Ser Ala Cys Glu His Ala Ile Ser Leu
            100                 105                 110

Leu Leu Ser Thr Ala Arg Gln Ile Pro Ala Ala Asp Ala Thr Leu Arg
        115                 120                 125

Glu Gly Glu Trp Lys Arg Ser Ser Phe Asn Gly Val Glu Ile Phe Gly
    130                 135                 140

Lys Thr Val Gly Ile Val Gly Phe Gly His Ile Gly Gln Leu Phe Ala
145                 150                 155                 160

Gln Arg Leu Ala Ala Phe Glu Thr Thr Ile Val Ala Tyr Asp Pro Tyr
                165                 170                 175

Ala Asn Pro Ala Arg Ala Ala Gln Leu Asn Val Glu Leu Val Glu Leu
            180                 185                 190

Asp Glu Leu Met Ser Arg Ser Asp Phe Val Thr Ile His Leu Pro Lys
        195                 200                 205

Thr Lys Glu Thr Ala Gly Met Phe Asp Ala Gln Leu Leu Ala Lys Ser
    210                 215                 220

Lys Lys Gly Gln Ile Ile Ile Asn Ala Ala Arg Gly Gly Leu Val Asp
225                 230                 235                 240

Glu Gln Ala Leu Ala Asp Ala Ile Glu Ser Gly His Ile Arg Gly Ala
                245                 250                 255

Gly Phe Asp Val Tyr Ser Thr Glu Pro Cys Thr Asp Ser Pro Leu Phe
            260                 265                 270

Lys Leu Pro Gln Val Val Val Thr Pro His Leu Gly Ala Ser Thr Glu
        275                 280                 285

Glu Ala Gln Asp Arg Ala Gly Thr Asp Val Ala Asp Ser Val Leu Lys
    290                 295                 300

Ala Leu Ala Gly Glu Phe Val Ala Asp Ala Val Asn Val Ser Gly Gly
305                 310                 315                 320

Arg Val Gly Glu Glu Val Ala Val Trp Met Asp Leu Ala Arg Lys Leu
                325                 330                 335

Gly Leu Leu Ala Gly Lys Leu Val Asp Ala Ala Pro Val Ser Ile Glu
            340                 345                 350

Val Glu Ala Arg Gly Glu Leu Ser Ser Glu Gln Val Asp Ala Leu Gly
        355                 360                 365

Leu Ser Ala Val Arg Gly Leu Phe Ser Gly Ile Ile Glu Glu Ser Val
    370                 375                 380

Thr Phe Val Asn Ala Pro Arg Ile Ala Glu Glu Arg Gly Leu Asp Ile
385                 390                 395                 400

Ser Val Lys Thr Asn Ser Glu Ser Val Thr His Arg Ser Val Leu Gln
                405                 410                 415
```

```
Val Lys Val Ile Thr Gly Ser Gly Ala Ser Ala Thr Val Val Gly Ala
            420                 425                 430

Leu Thr Gly Leu Glu Arg Val Glu Lys Ile Thr Arg Ile Asn Gly Arg
        435                 440                 445

Gly Leu Asp Leu Arg Ala Glu Gly Leu Asn Leu Phe Leu Gln Tyr Thr
    450                 455                 460

Asp Ala Pro Gly Ala Leu Gly Thr Val Gly Thr Lys Leu Gly Ala Ala
465                 470                 475                 480

Gly Ile Asn Ile Glu Ala Ala Ala Leu Thr Gln Ala Glu Lys Gly Asp
                485                 490                 495

Gly Ala Val Leu Ile Leu Arg Val Glu Ser Ala Val Ser Glu Glu Leu
            500                 505                 510

Glu Ala Glu Ile Asn Ala Glu Leu Gly Ala Thr Ser Phe Gln Val Asp
        515                 520                 525

Leu Asp
    530
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<210> 13
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Construct

<400> 13

tctagagccg gagacgtgaa taaaat 26

<210> 14
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Construct

<400> 14

ggatccgact ggtgagggtc aagtcc 26

<210> 15
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Construct

<400> 15

ggatccttaa ccggaaacgt tcacagc 27

<210> 16
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Construct

<400> 16

ggatccttac tcttcgccca cgcgacc 27

<210> 17
<211> 31
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Construct

<400> 17

ggatacctta agccagaatc catccacaca g 31

<210> 18
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Construct

<400> 18

ggatccttac ttgccagcaa gaaaagacc 29

<210> 19
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Construct

<400> 19

ggatccttaa tccaggccac ggccatt 27